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2011, a keyboard portion 2012 that is an operation portion, a speaker portion 2013, and the like. The present invention is applied to the manufacturing of the display portion 2011.

According to the present invention, by dispersing the photocatalyst substance in the organic compound layer, and using a photocatalyst function of the photocatalyst substance, an organic compound is decomposed (broken) to make the layer rough and an element layer is peeled from the substrate. Therefore, since it is unnecessary to apply a large amount of power to the element layer in order to peel it, the element is not broken during the peeling process and an element with good shape can be transferred to various types of substrates as appropriate.

According to the present invention, a semiconductor device and a display device can be manufactured using a peeling process, in which a transfer process can be conducted with a good state in which a shape and property of the element before peeling are kept. Therefore, highly reliable semiconductor devices and display devices, and further, television device equipped with such devices can be manufactured with high yield without complicating the apparatus and the process for manufacturing.

As a matter of course, the present invention is not limited to the television device. The present invention can be applied to various applications such as monitors of personal computers, particularly large-sized display media typified by information display boards at train stations, airports, or the like, and advertising display boards on the street.

#### Embodiment Mode 17

Electronic devices of the present invention includes: television devices (also simply referred to as TVs or television receivers), cameras such as digital cameras and digital video cameras, mobile phone sets (also simply referred to as cellular phone sets or cellular phones), portable information terminals such as a PDA, portable game machines, monitors for computers, computers, audio reproducing devices such as car audio sets, image reproducing devices provided with a recording medium such as home-use game machines, and the like. Specific examples thereof will be explained with reference to FIGS. 26A to 26E.

A portable information terminal shown in FIG. 26A includes a main body 9201, a display portion 9202, and the like. The display device of the present invention can be applied to the display portion 9202. Thus, a portable information terminal which is light weight, thin, and highly reliable can be provided.

A digital video camera shown in FIG. 26B includes a display portion 9701, a display portion 9702, and the like. The display device of the present invention can be applied to the display portion 9701. Thus, a digital video camera which is light weight, thin, and highly reliable can be provided.

A cellular phone set shown in FIG. 26C includes a main body 9101, a display portion 9102, and the like. The display device of the present invention can be applied to the display portion 9102. Thus, a cellular phone set which is light weight, thin, and highly reliable can be provided.

A portable television set shown in FIG. 26D includes a main body 9301, a display portion 9302, and the like. The display device of the present invention can be applied to the display portion 9302. Thus, a portable television set which is light weight, thin, and highly reliable can be provided. The display device of the present invention can be applied to various types of television sets including a small-sized television mounted on a portable terminal such as a cellular

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phone set, a medium-sized television that is portable, and a large-sized television (for example, 40 inches in size or more).

A portable computer shown in FIG. 26E includes a main body 9401, a display portion 9402, and the like. The display device of the present invention can be applied to the display portion 9402. Thus, a portable computer which is light weight, thin, and highly reliable can be provided.

By the display device of the present invention, electronic devices which are light weight, thin, and highly reliable can be provided.

#### Embodiment Mode 18

Structure of a semiconductor device of this embodiment mode will be described using FIG. 21A. As shown in FIG. 21A, a semiconductor device 20 of the present invention has a function of communicating data in a non-contact manner, which includes a power supply circuit 11, a clock generating circuit 12, a data modulating-demodulating circuit 13, a controlling circuit 14 for controlling another circuit, an interface circuit 15, a memory circuit 16, a data bus 17, and an antenna (an antenna coil) 18, a sensor 21, and a sensor circuit 22.

The power supply circuit 11 is a circuit generating various power supplies to be supplied to each circuit in the semiconductor device 20 based on an alternating signal input from the antenna 18. The clock generating circuit 12 is a circuit generating various clock signals to be supplied to each circuit in the semiconductor device 20 based on an alternating signal input from the antenna 18. The data modulating-demodulating circuit 13 has a function of modulating and demodulating data to be communicated with a reader-writer 19. The controlling circuit 14 has a function of controlling the memory circuit 16. The antenna 18 has a function of transmitting and receiving an electromagnetic wave or an electric wave. The reader-writer 19 communicates with the semiconductor device, controls the semiconductor device, and controls processing of the data thereof. The semiconductor device is not limited to the above structure; for example, another element such as a limiter circuit of power supply voltage or hardware dedicated for code processing may be added.

The memory circuit 16 includes a memory element in which an organic compound layer or a phase-change layer is sandwiched between a pair of conductive layers. Note that the memory circuit 16 may include only the memory element in which an organic compound layer or a phase-change layer is sandwiched between a pair of conductive layers or include a memory circuit having another structure. The memory circuit having another structure corresponds, for example, to one or a plurality of a DRAM, an SRAM, a FeRAM, a mask ROM, a PROM, an EPROM, an EEPROM, and a flash memory.

The sensor 21 is formed from a semiconductor circuit such as a resistor element, a capacitive coupling element, an inductive coupling element, a photovoltaic element, a photoelectric conversion element, a thermoelectric conversion element, a transistor, a thermistor, or a diode. By the sensor circuit 22, a change of impedance, reactance, inductance, voltage, or current, is detected and is subjected to analog-digital conversion (A/D conversion), so that a signal is output to the controlling circuit 14.

#### Embodiment Mode 19

According to the present invention, a semiconductor device functioning as a chip having a processor circuit